

Summary of 1999-2000 Spawning-Ground Surveys and Commercial Catch in Tomales Bay

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Review of 1999-00 Tomales Bay Pacific Herring Season

- ☐ Eelgrass beds in the major spawning areas of Tomales Bay showed signs of continued health this season with above average density and coverage. The red algae, *Gracilaria*, which was rarely encountered in samples last season, was found in thick mats adjacent to Marconi Cove and Tomasini Point in this perennial spawning location.
- ☐ The preliminary spawning biomass estimate of 2,011 tons is about one-half last season's 4,069 ton biomass. While this season's biomass is well below the 25-year long term average of 4,777 tons, it is only 25 percent less than the 7-year average of 2,678 tons since the Tomales Bay herring fishery re-opened in the 1992-93 season.
- ☐ There were nine significant spawns this season with the first major spawn totaling 105 tons on December 5th and the last significant spawn occurring February 27th at 96 tons. Herring spawning activity peaked during the first two weeks of January with 985 tons recorded. Notable this year were the number of trace spawns (< 1 ton) observed by biologist at the beginning and end of the spawning season.
- ☐ Herring schools did not show "typical" holding patterns for Tomales Bay in which schools appear to increase in population in the bay over a several day period before spawning. The persistent presence of "red tide" (dinoflagellate) organisms throughout the month of January may have had some effect on herring behavior. The bioluminescence which these planktonic organisms produce when disturbed was illuminating all objects moving through the water at night including boats, gillnets, harbor seals and herring.
- ☐ The 42 ton catch was 358 tons short of the 400 ton season quota and was equivalent to an exploitation rate of only 2.1 percent which was similar to last season's 1.3 percent exploitation rate. Boats averaged approximately 3,500 pounds-per-landing, 16 % below the 5-year average (excluding the 1997-98 El Nino) with the average roe count at 15.2 %. The mean length of commercially caught herring was not significantly larger than last season. Preliminary ages for this season suggest that length-at-age for age groups four and older seems to have decreased from the 1998-99 season.
- ☐ A townhall meeting was held February 17th at the Bodega Bay Grange Hall to discuss the state of the Tomales Bay fishery and related management issues. The meeting was well attended and topics discussed ranged from the Department's gillnet mesh study to opening outer Bodega Bay. However, conversations concerning poor catches and the need to decrease the current mesh size to make the fishery economically viable dominated the meeting. It was expressed by Department biologists that any regulation change would most likely have to be preceded by a mesh-size study.

Table 1
Tomales Bay Herring Spawn Data, 1999-2000 Season

Date	Location	Area M²	Eggs/ M²	Millions of Eggs	Conversion Factor X 10⁻⁸	Tons
05-Nov-99	unknown	--	--	--	--	T
15-Nov-99	28A	--	--	--	--	T
05-Dec-99	1A	38,368	198,468	7,610	1.38	105
07-Dec-99	28	--	--	--	--	T
07-Dec-99	28A	--	--	--	--	T
19-Dec-99	28C	3,666	393,971	1,440	1.38	19.9
19-Dec-99	28A	5,017	114,093	572	1.38	7.9
19-Dec-00	Marconi	3,666	29,219	107	1.38	1.5
02-Jan-00	1A	14,704	543,436	9,230	1.38	110.3
02-Jan-00	1A	5,956	547,997	1,750	1.38	24.2
02-Jan-00	1B	18,965	1,242,633	23,600	--	325.2
02-Jan-00	1C	1,431	993,081	1,420	--	19.6
11-Jan-00	28C	4,176	214,312	895	1.38	12.4
11-Jan-00	Marconi	23,740	1,506,354	35,800	1.38	493.5
16-Jan-00	28	29,496	384,239	11,300	1.38	156.4
19-Jan-00	1A	--	--	--	--	T
19-Jan-00	28A	16,167	430,588	6,960	1.38	96.1
19-Jan-00	Marconi	6,867	254,898	1,750	1.38	24.2
27-Jan-00	28C	--	--	--	--	T
27-Jan-00	7	6,838	268,558	1,840	1.38	25.3
27-Jan-00	8	5,697	636,563	3,630	1.38	50.4
02-Feb-00	28C	--	--	--	--	T
02-Feb-00	28A	23,975	350,756	8,410	1.38	116.0
15-Feb-00	1B	--	--	--	--	T
15-Feb-00	10A	4,749	369,397	1,750	1.38	24.2
15-Feb-00	2	7,890	630,851	4,980	--	68.7

Table 1
Tomales Bay Herring Spawn Data, 1999-00 Season (cont.)

Date	Location	Area M²	Eggs/ M²	Millions of Eggs	Conversion Factor X 10⁻⁸	Tons
21-Feb-00	8	--	--	--	--	T
22-Feb-00	2	--	--	--	--	T
07-Mar-00	8	--	--	--	--	T
11-Mar-00	1	--	--	--	--	T
TOTAL						1969

T = Trace Spawn : less than 1 ton

TABLE 2.
Tomales Bay Herring Biomass Estimates 1973-74 through 1999-00 Season

Season	Spawn Escapement (tons)	Catch (tons)	% Catch (Exploitation Rate)	Spawning Biomass (tons)
1973-74	6,041	521	7.9	6,562
1974-75	4,210	518	10.9	4,728
1975-76	7,769	144	1.8	7,913
1976-77	4,739	344	6.7	5,083
1977-78	21,513	646	2.9	22,163
1978-79	—	448	--	--
1979-80	5,420	603	10	6,023
1980-81	5,128	448	8	5,576
1981-82	6,298	851	11.9	7,149
1982-83	10,218	822	7.4	11,040
1983-84	1,170	110	8.5	1,280
1984-85	6,156	430	6.5	6,586
1985-86	435	771	12.8	6,000*
1986-87	4,931	867	14.9	5,798
1987-88	1,311	750	36.4	2,061
1988-89	167	213	56	380
1989-90	345	--	0	345
1990-91	779	--	0	779
1991-92	1,214	--	0	1,214
1992-93	3,856	222	5.4	4,078
1993-94	2,244	219	8.9	2,463
1994-95	3,704	275	7.4	3,979
1995-96	1,704	355	17.2	2,059
1996-97	1,288	222	15.1	1,510
1997-98	586	0	0	586
1998-99	4,015	54	1.3	4,069
1999-00	1,969	42	2.1	2,011
AVERAGE	4,124	411	8.2	4,671

*Biomass estimated by cohort analysis; for all other years, biomass was estimated from spawning-ground surveys.

TABLE 3 Daily Landings by Tomales Bay Gillnet Fleet for 1999-2000 Season					
Date	Pounds	Tons	Trips	Lbs/ Trip	Roe Count
04-Jan-00	250	0	1	250	NA
03-Feb-00	79,720	40	15	5,315	15.21
15-Feb-00	3,288	2	8	548	14.29
TOTAL	83,258	42	24	AVG. = 2,038	AVG. = 15.2
AVG 94/95 - 99/00	378,389*	186*	84*	4,171*	13.52*
AVG 89/90 - 99/00	318,476*	159*	81*	3,735*	13.26*

*Lbs/Trip data from 1997-98 not included in the calculation of average (no landings in 97/98).

TABLE 4 Mean Length (mm BL) of the Tomales Bay Commercial Gill Net Catch					
Date		Mean Length		Sex Ratio M/F	
02-03-00		188.1		32.3/67.7	
02-09-00		185.4		30/70	
02-15-00		186.7		36.1/63.9	
02-23-00		188.4		40/60	
Historical Lengths of Commercial Gill Net Catch					
5-Yr Avg	1995-96	1996-97	1997-98	1998-99	1999-00
191.7	189.2	194.8	196*	186.3	187.6

*The fish were not commercially landed, but were caught commercially.

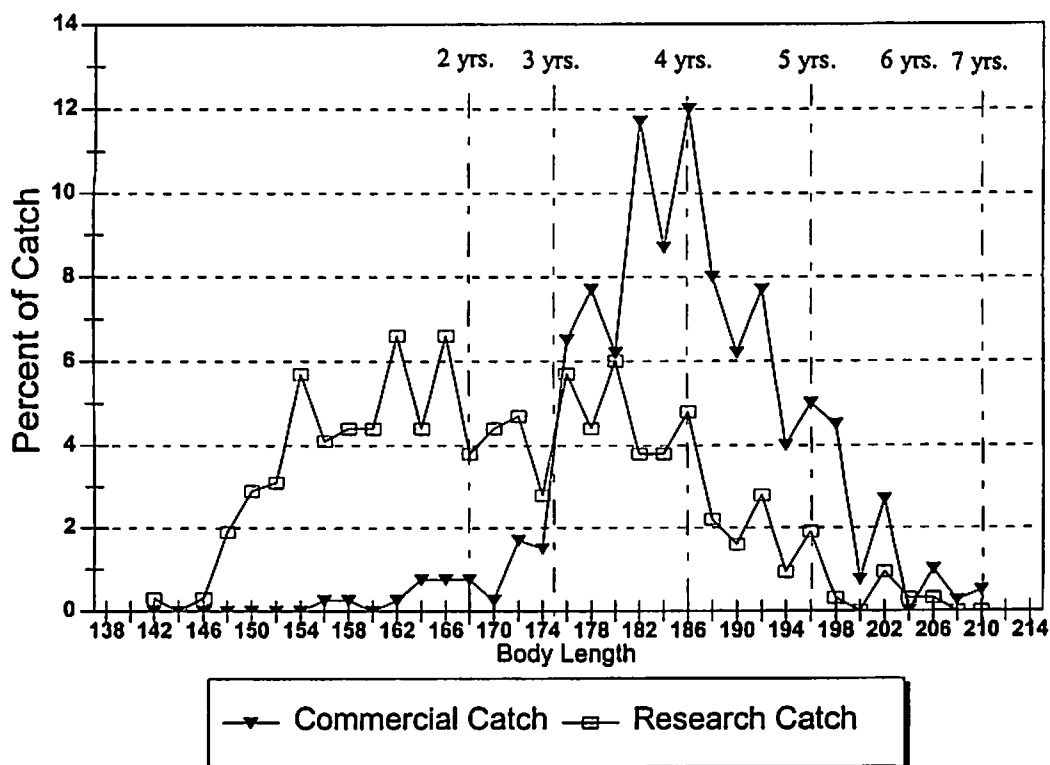
TABLE 5 Annual Landings from Tomales/Bodega Bay Gillnet Fleet					
Year	Pounds	Tons	Trips	Lbs/Trip	Roe Count
84-85	844,472	422.2	215	3,928	12.8
85-86	1,542,676	771.3	512	3,013	12.5
86-87	1,732,428	866.2	429	4,038	12.5
87-88	1,499,402	749.5	484	3,097	12.4
88-89	426,163	213.0	291	1,464	12.7
89-90	190,409	95.2	61	3,121	13.5
90-91	173,103	86.5	72	2,404	13.6
91-92	47,125	23.5	30	1,571	14.6
92-93*	444,312	222.3	66	6,732	11.0
93-94*	437,867	218.9	164	2,670	12.3
94-95*	550,262	275.1	84	6,551	12.0
95-96*	710,573	355.3	134	5,303	13.8
96-97*	443,128	222.0	126	3,517	11.6
97-98*	0	0	0	0	--
98-99*	104,722	54	52	2,014	15.0
99-00*	83,258	42	24	3,469	15.2
Average	576,869	288.5	171	3,374	13.0

* Catch from Tomales Bay only, outer Bodega Bay closed to fishing.

Tomales Bay Herring Length Frequency Summaries

Length Frequency

Commercial vs. Research Catch, 98-99



Length Frequency

Commercial vs. Research Catch, 99-00

